1020-68 **Thromboembolic Risk Stratification Based on SPAF Clinical Criteria in Patients With Paroxysmal Atrial Fibrillation and Flutter: A Prospective Transesophageal Echocardiography Study**

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It has been reported that patients (Pts) with paroxysmal atrial fibrillation and flutter (PAT) have a lower thromboembolic (TE) risk than those with permanent atrial fibrillation (AF). However, a recent longitudinal study suggested a similar annual rate of ischemic stroke in both populations. This apparent discrepancy could be explained by differences in the frequency of transesophageal echocardiography (TEE)-detected TE risk markers.

Objective : We sought to assess TE risk markers using TEE in Pts with PAT according to the SPAF clinical criteria for risk stratification.

Methods : As part of an ongoing study based on transthoracic and TEE in atrial arrhythmia, we prospectively studied 145 Pts within 48 hours of spontaneous cardioversion of any documented PAT (AF in 120 Pts, atrial flutter or tachycardia in 25 Pts). Pts were divided into high, moderate and low clinical risk groups. The following parameters were evaluated : left atrial (LA) and LA appendage (LAA) areas, spontaneous echo contrast (SEC), LAA end diastolic emptying velocity (Vel), LAA thrombus (Thr) and thoracic aorta atheroma (TAA).

Results : The main results are summarized in the table.

	High risk (n=66)	Moderate risk (n=34)	Low risk (n=45)	p
Mean age (years)	77.9 ± 9.9	63.6 ± 7.3	54.2 ± 15.3	<0.001
LA area (cm²)	19.9 ± 5.6	19.3 ± 4	18.3 ± 5.5	0.937
LAA area (cm²)	4.9 ± 2.3	4.4 ± 1.7	4.6 ± 1.9	0.987
LAA Vel ≤25 cm/s (n,%)	13 (20.6)	10 (29.4)	13 (30)	0.460
LA SEC (n,%)	22 (35)	5 (15.1)	5 (11.6)	0.007
LAA Thr (n,%)	2 (3)	0	1 (2.2)	0.599
TAA ≥ 4mm (n,%)	15 (22.7)	5 (14.7)	2 (4.4)	0.031

There was no difference in the 3 groups with regard to LA and LAA areas, Vel and Thr. LA SEC and TAA were significantly more frequent in high risk Pts using SPAF clinical criteria.

Conclusion : These results suggest the need for a similar risk stratification and anticoagulant regimen in high-risk patients with PAT and permanent AF.

POSTER SESSION

1021 Evolving Applications of Micro Bubbles and Ultrasound

Sunday, March 17, 2002, 9:00 a.m.-11:00 a.m.
Georgia World Congress Center, Hall G
Presentation Hour: 10:00 a.m.-11:00 a.m.

1021-53 **Specific Fibrin Enhancement With Targeted Echogenic Immunoliposomes**

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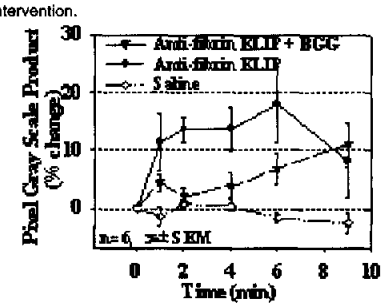
Background/Methods: Targeted echogenic immunoliposomes (ELIP) for enhancement of vasoactive and pathological components of atherosclerosis (ATH) have been developed. Non-specific intravascular ultrasound (IVUS) enhancement of fibrin by IgG ELIP has been shown. However specific binding of ELIP to fibrin, that results in IVUS enhancement has not been demonstrated. IVUS imaging occurred prior to and after IgG, anti fibrin and anti-fibrinogen conjugated ELIP injections (8mg) at 1,2,4,6,9 minutes with and without bovine gamma globulin (BGG) 1mg/ml to block non-specific binding.

Results: IGG and anti-fibrinogen and anti-fibrin ELIP without BGG non-specifically enhanced fibrin at 1min and maximally at 6 min ($p<0.01$). IgG and anti-fibrinogen ELIP were the no different from control in the presence of BGG at all times. Anti-fibrin ELIP in the presence of BGG specifically bound and enhanced fibrin at 6 min and maximally at 9 minutes vs saline ($p<0.05$).

Conclusion: In this model we have demonstrated that specific binding of ELIP is sufficient to enhance the IVUS image of fibrin. The time required for specific vs. non-specific enhancement is slightly prolonged due to competition at binding sites. These data allow for further development of ELIP for specific molecular imaging for use in staging ATH for diagnosis and intervention.



1021-54 **Effects of Various Microbubble Composition on the Interactions With Activated Leukocytes**

Hiroto Takeuchi, Koji Ohmori, Isao Kondo, Akira Oshita, Kaori Shinomiya, Kazushi Yukiiri, Yuichiro Takagi, Yang Yu, Katsufumi Mizushige, Masakazu Kohno, *Kagawa Medical University, Kagawa, Japan.*

Background: Interactions between activated neutrophils and microbubbles including adhesion and phagocytosis have been utilized to deliver microbubbles to the site of inflammation. The aim of this study was to examine the effect of various characteristics of microbubbles on this application. **Methods:** Sonicated albumin (SA: albumin shell, air), Optison® (OPT: albumin shell, octafluoropropane gas), BR1 (phospholipid shell, sulfur hexafluoride gas), and BR14 (phospholipid shell, perfluorobutane gas) (Bracco) were tested. The 4 agents were respectively incubated in RPMI 1640 medium containing serum on the cell culture slides with human neutrophils ($2x10^6$/mL) activated by phorbol-12-myristate-13-acetate at 37 degree to allow interactions on an intravital microscope. **Results:** At 3 minutes after the onset of reaction, adhesion of 1-3 microbubbles to some of the leukocytes was observed for all agents. At 15 minutes, the number of leukocytes that phagocytosed microbubbles per 50 leukocytes was 3±1 cells for SA, 12±3 cells for OPT, 12±2 cells for BR1, and 13±3 cells for BR14. At 30 minutes, no leukocytes contained microbubbles for SA, and majority of the microbubbles were digested leaving only a few leukocytes (2±1 cells) containing microbubbles for OPT. However, for BR1 and BR14, the number of leukocytes containing microbubbles remained unchanged. In addition, the size and shell structure of intracellular microbubbles remained unchanged for BR1 and BR14. **Conclusions:** This study demonstrated that the phospholipid-stabilized microbubbles are stable as compared with those with albumin shell in the cytoplasm of the leukocyte after the phagocytosis. A stable acoustical property may be better provided by these microbubbles at the site of inflammation.

1021-55 **How Well Can Real-Time Perfusion Imaging by Myocardial Contrast Echocardiography Detect Peri-Infarction Ischemia? Comparison of Adenosine Stress and Dobutamine Stress**

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Background: Peri-infarct ischemia, perfusion deficit adjacent to or around a fixed resting defect, is well detected by nuclear imaging. While real-time perfusion imaging (RTPI) using ultrasound contrast agents has been shown to detect infarction and coronary stenosis, its accuracy in the assessment of peri-infarct ischemia (where a resting perfusion defect already exists) is not known.

Methods: We employed RTPI modality (Agilent and ATL Philips) in a canine model (15 dogs) of distal coronary occlusion (CO) and proximal coronary stenosis. Using coronary flow probe recordings, physiologic significance of proximal coronary stenosis was established by confirming abolition of coronary reserve. Contrast agent, Optison was given as slow bolus injections at baseline, during prolonged distal CO, during adenosine bolus stress and during dobutamine stress. Triphenyltetrazolium chloride (TTC) staining was used to verify distal infarction. RTPI recordings at baseline, distal CO and stress protocols were randomly mixed and reviewed blindly.

Results: In all but one dog, RTPI detected distal infarct as small as 9% of the left ventricle. The sensitivity, specificity and overall diagnostic accuracy of RIPI in the detection of distal infarcts were: 93%, 87%, and 90%. Sensitivity, specificity, and overall diagnostic accuracy of RTPI in the assessment of peri-infarction ischemia were: for adenosine stress, 87%, 87% and 87%; for dobutamine stress, 92%, 92% and 92%. The spatial extent of perfusion defect related to peri-infarct ischemia was similar during both adenosine and dobutamine stress ($y=0.9x+2.2$, $r=0.89$, $p<0.001$).

Conclusion: 1) Even small distal infarcts can be detected by RTPI; 2) Peri-infarct ischemia can be accurately recognized by RTPI during stress; 3) Adenosine and dobutamine stress appear equally reliable in RTPI evaluation of peri-infarct ischemia.

1021-56 **Myocardial Opacification at Intravenous Myocardial Contrast Echocardiography Depends on the Depth of Focus Point: In Vivo and In Vitro Study**

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Background: Myocardial opacification is not always homogeneous even in a normal heart.

Purpose: The aim of this study is to reveal the effect of the focus point on the myocardial opacification.

Methods: In vivo, we studied baseline-subtracted peak videointensity (bs-PV) at anterior, septal and lateral walls of the short axis view by changing the position of focus at near, middle and far, during injection of Optison (0.1ml/min) in 6 open-chest dogs. In vitro, acoustic pressure at various points in a water tank was measured using a hydrophone. The hydrophone was set at 20, 40 and 60 mm from the transducer and the ultrasound beam was deviated to the 0, 5, 10 degree from the line connecting the transducer and the hydrophone. The negative peak acoustic pressure was measured at each setting by changing the focus at near, middle and far position.

Results: The opacification of the anterior wall was faint at far focus, and bs-PV was almost half of that at near focus. In vitro, when the focus was far, the acoustic pressure of the near field was still high even if the ultrasound beam did not aim the hydrophone. When the focus was near, the pressure decayed as the ultrasound beam deviated from the hydrophone.

Conclusion: When the focus point is set far, the acoustic pressure around the anterior is